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REPORTS OF OBSERVATORIES, 1909.

NAVAL OBSERVATORY, MARE ISLAND, CALIFORNIA.

The work of this observatory has continued as in former years, and the time service and rating and issue of chronometers have been maintained as heretofore. Excavation and blasting preparatory to the building of a central power plant near the observatory have occasioned considerable disturbance to the instruments; and this development of the Navy Yard may necessitate the removal of the observatory to a new site before many years.

The researches in cosmogony mentioned in the last annual report have been greatly developed during the past year, and preliminary accounts of the work have been published in the *Astronomische Nachrichten*, in the *Publications* of this Society, and in other journals. This work consisted in the development of what is known as the capture theory of cosmical evolution, which will be more fully treated in Volume II of the writer's "Researches on the Evolution of the Stellar Systems," now in press and soon to be offered to the public. This is to be a large volume of more than six hundred pages, and has entailed a large amount of labor and the review of a subject of vast extent. But it is believed that the result will be to give cosmogony a much more secure foundation than has been possible heretofore.

The capture theory is based on dynamical principles, and illustrated by phenomena observed in the spiral nebulae, the planetary system, the double and multiple stars and clusters, and the star-clouds of the Milky Way. The aim is to show that the planets were never detached from the Sun and the satellites never detached from their planets by rotation, as imagined by LAPLACE; but that all these bodies were formed in our solar nebula and have been captured and developed into the system we now observe, by motion in a resisting medium, which has greatly reduced the size of the orbits and rounded them up into almost perfect circles. This process of capture is shown to give the general laws of cosmical evolution, which heretofore have been sought in vain. All the principal phenomena of the solar system are brought into simple mutual relationship, and easily accounted for by known causes. Many of the

problems treated, such as the constancy of the length of the day, the origin of the terrestrial Moon, the secular acceleration of the Sun and Moon, the rotations and obliquities of the planets, etc., will open up new fields of thought which can hardly fail to be of great interest to astronomers and other men of science. It is shown by a satisfactory line of argument that, in general, there are planets about the fixed stars, and only the larger of these bodies may be recognized as visual and spectroscopic double and multiple stars.

May 24, 1910.

T. J. J. SEE,

*Professor of Mathematics, U. S. Navy,
in charge of the Observatory.*

CHAMBERLIN OBSERVATORY, UNIVERSITY PARK, COLORADO.

During the year 1909 the 20-inch equatorial was used almost exclusively for observations of comets. A good deal of work in reducing past observations was done by Miss MYRTLE L. RICHMOND and Mr. IRVING WHITEHEAD.

H. A. HOWE, *Director.*
